In the Claims

12. (amended) A method of manufacturing a heat pipe construction, comprising the steps of:

providing a tubular pipe with an open end;

overmolding a polymer composite material around said tubular pipe leaving said open end free of polymer composite material;

filling said tubular pipe with heat pipe media via said open end after overmolding said polymer composite material around said tubular pipe; and

closing said open end with said heat pipe media sealed therein.

REMARKS

This amendment is responsive to the official action dated May 3, 2002.

Claims 1-14 were pending in the application. Claims 4, 6 and 9-11 were withdrawn from consideration. Claims 1-3, 5, 7, 8 and 12-14 were rejected. No Claims were allowed by the Examiner.

By way of this amendment, the Applicant has amended Claim 12. The remaining claims are unchanged. Accordingly, Claims 1-3, 5, 7, 8 and 12-14 are currently pending.

I. DOUBLE PATENTING OBJECTION

The Examiner stated that the claims pending in the present invention are directed to the same invention as that of commonly assigned application 09/757,541. The Examiner has therefore required that the Applicant state which entity is the prior inventor of the conflicting subject matter.

The pending claims in the present invention are directed to a method of manufacturing a heat pipe device having an object formed thereabout. The method includes specific steps relating to the process by which a heat pipe is molded into a heat

dissipation device without damaging the heat pipe in the process. The method begins with an **uncharged** heat pipe and results in a net shape molded heat sink. Claim 12 has been amended to clarify the order of the steps in the Applicant's invention.

The claims pending in application no 09/757,541 are directed to a method of manufacturing a heat spreader by first providing a fully charged heat pipe, laminating it between a top and bottom metallic spreader plate and filling the void there between with a thermally conductive polymer composition. The heat pipe is **fully charged** before the process begins and the invention is not net shape molded as the final shape is dictated by the top and bottom plates not the injection molded polymer.

Since the present invention recites a method that is not described or claimed in the cited application and since the cited application includes limitations not included in the present invention, the claimed subject matter does not conflict with pending Serial No. 09/757,541. The two inventions do not overlap and are patentably distinct. Applicant therefore respectfully requests that the Examiner withdraw this rejection.

II. REJECTION OF CLAIMS UNDER 35 USC 112

Claim 5 was rejected by the Examiner under 35 USC 112, second paragraph as being indefinite. The Examiner stated that the word "insert" should be replaced with the word –inserting--. The applicant asserts however that the use of the word "insert" is correct. The term of art in the relevant field is "***insert*** molding" not inserting molding. The term means a process whereby predetermined elements are placed at least partially within an empty injection molding cavity followed by the injection of a molding composition. In this manner, a part is formed often of two different materials where one section of the part is net shape injection molded from a first, injection moldable material and the other section of the part is preformed from a second material. This process is called "insert molding". Therefore, in this context, the usage in Claim 5 is correct. Withdrawal of this rejection is respectfully requested.

III. REJECTION OF CLAIMS UNDER 35 USC 102

Claims 1-3, 5 and 7-8 were rejected under 35 USC 102(b), as being anticipated by Applicant's Admitted Prior Art (AAPA) in the background of the invention. The Examiner has stated that the AAPA states that all of the steps are old. However, the Applicant has stated in the background of the invention that in the prior art, ***charged*** heat pipes were molded into devices, often resulting in damage to the fragile structure. Frequently, when subjected to the heat and pressure of the injection molding process, the outer shell of the heat pipe would rupture of crack allowing the media to escape. In this manner, the AAPA devices resulted in high defect rates.

The present invention represents an improvement over the manufacturing ***methods*** provided in the AAPA. The present invention first injection molds a finished part around a piece of copper tubing. The copper tubing is then charged with a phase change media and the tubing is then sealed. This process is different than the process provided in the prior art, resulting in less defective parts. Therefore, the method of the present invention is different than the method provided in the AAPA. Claim 12 has been amended to clarify Applicant's method.

Since the present invention includes elements and process limitations that were not provided in the reference cited by the Examiner, the present rejection cannot be maintained. The Applicant respectfully requests withdrawal of this rejection.

IV. REJECTION OF CLAIMS UNDER 35 USC 103

Claims 12-14 were rejected under 35 USC 103(a) as being unpatentable over AAPA in view of US Patent No. 6,050,331 (Breault et al.). The Examiner has stated that AAPA teaches a method of manufacturing a heat pipe but lacks the step of filling the heat pipe after molding the conductive material around the pipe shell. The Examiner has further stated that Breault discloses charging the tube after the molding step and that it would have been obvious to one skilled in the art to combine the references to arrive at the present invention.

However, the disclosure in Breault provides a cooling plate that is incorporated into a larger system that employs a large coolant loop or even an open coolant loop.

therefore, charging in the Breault disclosure does not take place until the part is installed into a larger system, piping connections are made and circulator pipes are attached. At this point, the system coolant loop is charged with a circulating coolant fluid. This system is analogous to the water coolant system in an automobile. The charging of the system is not part of the process of manufacturing the part at all but part of the overall final assembly.

Further, it would not have been obvious to combine the AAPA with the Breault reference because the holder plate 20 is made from an FEP material loaded with graphite flakes. This composition cannot be injection molded, as an FEP polymer is a resin that does not cure to a solid state without the addition of other agents such as a catalyst and a subsequent curing step. As a result, Breault has included bounding layers 4, 6, 12 and 14 to contain the FEP composition and maintain it in a position around the pipe element.

The present system provides a completely self contained ***passive*** cooling system where a heat pipe shell is molded into a heat dissipation object, charged with a phase change media and sealed so as to operate in a free standing passive heat dissipation loop. In order to complete the part, the heat pipe must be charged. In addition, the present invention provides for a fully completed net shape injection molded part that does not require additional structure or components it retain the polymer composition in an operative position around the heat pipe.

As a result, since the Breault reference does not provide a teaching that supports the assertion made by the Examiner, it would not have been obvious to use the teaching in the AAPA in combination with the Breault reference to arrive at the present invention. Therefore, the Applicant requests withdrawal of this rejection.

V. CONCLUSION

Accordingly, Claims 1-3, 5, 7, 8 and 12-14 are believed to be in condition for allowance and the application ready for issue.

Corresponding action is respectfully solicited.

PTO is authorized to charge any additional fees incurred as a result of the filing hereof or credit any overpayment to our account #02-0900.

Respectfully submitted,

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ATTACHMENT A

Copy of amended claims with markings to show revisions made.

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overmolding a polymer composite material around said tubular pipe leaving said open end free of polymer composite material;

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